

**“Feasibility Analysis (Critique) of Basin-Wide Salmon Recovery Strategy (Draft)”**  
**Volume Two**

**The Habitat Element**

**1.0 Introduction**

The Columbia River Inter-Tribal Fish Commission has asked me to conduct a feasibility analysis (critique) of the *Habitat Element of the Conceptual Recovery Plan* contained within the *Draft Basin-wide Salmon Recovery Strategy* (a.k.a. *All H-Paper*) prepared by the National Marine Fisheries Service (NMFS) in consultation with the Federal Caucus. The document is described as a Final Draft and dated July 27, 2000. The document contains ten major sections and covers the four “H”s of habitat, harvest, hatcheries, and hydropower. Other sections cover the dynamics of recovery planning, implementation, monitoring, policy, and public involvement. This critique will focus on the feasibility, reality, and specifics of the habitat element in its role of recovering salmonid stocks listed under the Endangered Species Act.

**1.1 Background and Experience of F. Al Espinosa, Jr.**

My name is F. Al Espinosa, Jr. I am a Certified Fisheries Scientist with over 30 years of experience in the research and management of fisheries resources. I am presently a Fisheries Consultant operating out of Moscow, Idaho and specializing in fisheries-land management interactions. My qualifications for conducting this review have been articulated in the Phase 1 segment of this project (ICBEMP and Subbasin Template evaluation). A summary description of my background and experience is presented in the Appendix section of this report. In short, I have extensive experience (27 years) with landscape, watershed, and fisheries planning and conservation in the Snake Mountain Province of the Columbia River Basin. I have worked extensively in the Clearwater River Subbasin—and to a lesser extent, in the Salmon and Tucannon River Subbasins.

**1.2 Literature, Documents and Reports Reviewed**

**In preparation for this critique, I have reviewed the following literature, documents, and data.**

- Habitat Element of the Conceptual Recovery Plan, Draft Basin-wide Salmon Recovery Strategy (Vol. 2) and pertinent sections of the strategy related to the habitat element.
- Draft Supplemental Environmental Impact Statement (including Aquatic Conservation Strategy, Summary, and Appendices) of the Interior Columbia Basin Ecosystem Management Project
- PACFISH and INFISH
- Forest Plans of the Clearwater, Nez Perce, Salmon, and Challis National Forests
- North Lochsa Face Project of the Clearwater National Forest (ROD, FEIS, Project Files, and Biological Assessments)
- Section 7 Watershed Biological Assessment of the Lochsa River Drainage, Clearwater River Subbasin

- Lochsa River Subbasin Assessment, Idaho Department of Environmental Quality (June 16, 1999) by Nicholas Bugosh
- Huntington, C. W. (1998) “*Streams and Salmonid Assemblages within Roaded and Unroaded Landscapes in the Clearwater River Subbasin*”
- Espinosa *et al* (1997) “*The Failure of Existing Plans to Protect Salmon Habitat in the Clearwater National Forest in Idaho*”
- Espinosa (1998) “*Upper Lochsa River Watershed Study*”
- Rhodes *et al* (1994) “*A Coarse Screening Process for Evaluation of the Effects of Land Management Activities on Salmon Spawning and Rearing Habitat in ESA Consultations*”
- Rhodes, J. J. and C. W. Huntington (1999) “*Watershed Evaluation and Habitat Response to Recent Storms*”
- Final Draft of the Subbasin Assessment Template (SAT) for the Northwest Power Planning Council’s Fish and Wildlife Program
- Huntington, C. W. 1998. “*Stream Conditions and Salmonid Abundance at Four Monitoring Stations on the Salmon River Ranger District, Nez Perce National Forest*”
- Huntington, C. W. 1999. “*Plan for Monitoring Sediment, Temperature, and Channel Conditions along the Mainstem South Fork Clearwater River.*”
- Biological Opinion of Road Reconstruction and Emergency Watershed Protection Projects, Lower South Fork Salmon River, NMFS
- Court Order (decision) of Cause No. CV-97-208-M-LBE, Wilderness Society *et al* vs. Dale Bosworth and James Caswell, U. S. Forest Service, Clearwater National Forest, Region One, 2000
- Court Order (decision) of Cause No. C99-67R, Oregon Natural Resources Council *et al* vs. National Marine Fisheries Service (Umpqua River Timber Sales and ESA Issues), 1999
- Bureau of Land Management, *Biological Assessment of Ongoing and Proposed Activities for Effects to Listed Sockeye Salmon, Fall Chinook Salmon, Spring/Summer Chinook Salmon, Steelhead Trout, Bull Trout, and BLM Sensitive Species*, Little Salmon River, Tributaries, and Face Drainages

## **2.0 The Critique**

### **2.1 Background**

With the precipitous decline of salmonid populations throughout the West and the subsequent listing of many species under the Endangered Species Act, the political entities and resource management agencies have been motivated to seek and implement a more comprehensive and ecological perspective. Ecosystem processes, assessments, and perspectives are now being touted and marketed by the resource management agencies. This “new” stewardship philosophy is being publicized by the agencies as a dawn of increased awareness, sensitivity, and consideration. This “new strategy” philosophy of resource management has been incorporated in the Interior Columbia Basin Ecosystem Management Project (ICBEMP), “ecosystem” projects (timber sales), the Columbia River Multi-Species Framework, and —the Basin-wide Salmon Recovery Strategy (SRS). The theme of this “new

strategy” is that with aggressive “improvements” to survival in the hydro system and the other “Hs”—primarily habitat—the federal government may be able to avoid breaching the lower four Snake River Dams.

I shall examine the reality and validity of this strategy and habitat focus to recover the species in peril. My emphasis will be on the watersheds and tributary habitats of the Snake Mountain Province.

## **2.2 Framework and Elements**

According to NMFS, solving the habitat puzzle across a landscape of mixed federal, state, tribal, and private lands is an essential and critical link in salmonid conservation. The agency outlines a habitat conservation strategy that gives the basin a “fast start”—with measures geared to produce short-term benefits. It describes a foundation for habitat strategies that are geared to the unique conditions of each subbasin and watershed. The overall strategy contains four major habitat elements (non-federal and federal tributary habitat, mainstem habitat, and estuary habitat) and an implementation process. This five part strategy is designed to link federal and non-federal programs in a “new” and “powerful” way by establishing priorities, conducting compatible assessments, planning, and coordination mechanisms while still recognizing the distinct roles of federal, state, tribal, and local interests.

My primary emphasis and analysis will be on the tributary habitat and to a lesser degree on the estuary conflicts and controversies.

## **2.3 Habitat Program Objectives**

The federal agencies describe three “overarching” objectives for habitat restoration for the long term:

- **Protect existing high quality habitats.**
- **Restore degraded habitats on a priority basis and connect them to other functioning habitats.**
- **Prevent further degradation of tributary and estuary habitat and water quality.**

These objectives are noble, but hardly new or innovative. Expectations that these objectives can be achieved lacks basis in substance, evidence, or history. Where or when have the federal agencies ever accomplished any of these objectives to an extent that fish stocks or species in peril have recovered—or that degraded habitat has been restored to its pre-impact condition? In the Clearwater and Salmon River Subbasins, I cannot cite one example where this has occurred. The history is that the agencies have failed to achieve these objectives in any substantial manner or level. Rhodes *et al.* (1994) and Espinosa *et al.* (1997) have documented the failure of existing plans to adequately protect aquatic resources in the Snake River Subbasin and Clearwater National Forest respectively. The large-scale loss and degradation of salmon habitat in the Snake River Subbasin and elsewhere in the Pacific Northwest is testimony to the failure of existing stewardship philosophies and their derivative land management plans. ICBEMP (2000) has also documented this failure for the entire Columbia River Basin. The objectives listed above were frequently an integral part of these failed management efforts. Recitation of the same noble objectives will not accomplish much.

## **2.4 Non-Federal Tributary Habitat**

A critical component of the SRS is the management of the non-federal tributary habitat. The federal agencies propose a program that will give a “fast start” to protecting productive habitat and fixing problems. The fast start involves identifying priority subbasins and priority actions. This so-called “fast start” involves mostly assessments and planning, including another round of subbasin planning. In my experience, a “fast start” does not equate to more planning. The strategy also contains many other major problems.

The strategy identifies 16 priority subbasins for action. The agencies will identify three of these subbasins per year to focus resources on achieving their objectives. The short-term strategy will concentrate on four measures that in federal authors’ opinions will likely produce significant biological benefits: protecting productive habitat, restoring tributary flows, screening and combining water diversions, and reducing passage obstructions. While the priority subbasins include the upper Salmon River (including the Middle Fork and the Lemhi tributaries), the Clearwater River Subbasin is excluded from consideration despite having ESA-listed fall Chinook, steelhead and bull trout. In addition, although the upper Salmon country has some flow and habitat problems, habitat is not the primary factor limiting the recovery and viability of the stocks—as pointed out by the SRS on page 17. In the Idaho subbasins, we have plenty of quality habitat to recover and sustain the Evolutionarily Significant Units (ESUs). Most of this habitat is under federal management and located in roadless/wilderness areas. *Tweaking the non-federal habitat* in the subbasins of the Snake Mountain Province will not recover the ESA-listed species. At best, it can only buy some time and lessen the rate of decline.

As one of its most critical measures, the “fast start” strategy identifies the protection of non-federal tributary habitat that is still productive and at risk of being degraded. The agencies plan to accomplish this protection through conservation easements, acquisitions, or other unspecified means. Contrary to the “fast start” objective, easements and acquisitions take time and money. Acquisition of small sub-reaches or reaches requires great expense, and protecting only small amounts of habitat within watershed systems that are dysfunctional (severely degraded) does not work. We have plenty of experience with the latter failed approach. Watershed responses to the flood events of 1995-1996 in the Snake River Subbasin and elsewhere in the Columbia Basin have significantly added to this experience (Rhodes and Huntington, 1999; Espinosa, 1998).

Another “fast start” procedure designed to protect productive habitats involves the federal agencies committing to work with non-federal entities. The “let’s work together” commitment is again old news and rhetoric. The entities have been working together for some time. However, the work generally avoids or ignores the Endangered Species Act—or delays dealing with significant recovery efforts. The strategy seems to be to engage in protracted displacement behavior. There are many examples of this strategy, with the most egregious example being the “no jeopardy” opinion of NMFS on the extensive dredging of the estuary by the Corps of Engineers (COE), despite listing the protection of estuary habitat as one of their primary recovery objectives. Under the threat of litigation, NMFS recently withdrew the decision pending consideration of other options and additional information.

The SRS identifies the Bureau of Reclamation (BOR) as the lead agency to fix flow, passage, and screening problems in the basin. However, the BOR lacks authority to fund much of this work. The SRS offers a speculative proposal that BPA will bridge the gap by providing funding if Congress provides authorization. This again is not a fast approach. BPA has also been identified as the lead agency in protecting existing habitats, however there are few specifics as to how they would meet this objective, e.g. the implementation section of the document was left intentionally blank. Even assuming there would be adequate funding, buying habitats and easements is an expensive and time-consuming process, especially where, as is the case here, protecting entire watersheds is the critical ecological objective—not acquiring small pieces of fragmented habitat.

The SRS identifies federal support required for “fast start” actions in all subbasins. The confidence in dealing with these issues, however, is uncertain and weak. The document states that tributary flow problems are widespread, and solutions are, to this point, largely undemonstrated. The agencies point out that the feasibility of solutions is an institutional question. In my opinion, it is primarily a matter of commitment and accountability on part of the institutions to comply with the Endangered Species Act and implement recovery. The SRS also offers another untried and speculative measure to restore tributary flows—a water brokerage plan. This plan is voluntary and demonstrative in purpose, with the primary emphasis being to demonstrate the viability of non-government methods of rebuilding stream flows. Government methods of rebuilding and providing adequate stream flows have a dismal record of accomplishment, and there is no compelling reason to believe that non-government methods would be more successful. This water brokerage plan is more “slow start” couched in “fast start” rhetoric.

The SRS next identifies a major sub-program to protect and avoid further degradation of tributary habitats. It proposes to “*integrate Clean Water Act and Endangered Species Act Requirements through TMDL Programs.*” This objective certainly can be characterized as another “*new strategy*” device. The agencies will seek funding for pilot programs to demonstrate how they will accomplish this objective. They list five sub-objectives: integrate processes to avoid duplication; develop mutual goals; provide watershed stakeholders with assurances allowable by law; protect/preserve fish habitats; and develop/promote lessons learned from other watershed groups. This specious objective again overflows with overly optimistic rhetoric. In Idaho and Washington, implementation and compliance with the Clean Water Act (CWA) and development of the TMDL program have been appalling failures. The emphasis in Idaho has been to circumvent and avoid compliance with the Clean Water Act. The emphasis has not been to restore water quality and recover fish habitats. The National Wildlife Federation recently reviewed and graded all the individual States’ efforts to implement and comply with the CWA. Idaho and Washington were given “F” grades for their efforts (NWF, 2000). To propose that the agencies will insure compliance with ESA through integration with the already botched implementation of the CWA is laughable.

Idaho's actions regarding 303 (d) listed water bodies similarly fail to establish a strong likelihood that CWA actions will aid species recovery. Although the state holds the primary leadership role in dealing with 303 (d) listed water bodies, and insuring compliance with the CWA, Idaho, in conjunction with non-federal entities and federal agencies, has spent most of its time and funding *removing* the impaired water bodies from the 303 (d) list. Removal occurs from employment of an unscientific, non-peer reviewed (or accepted) assessment procedure (BURP) that allegedly defines impairment or non-impairment. In 1998, Idaho recommended the removal of 320 streams—and the Environmental Protection Agency (EPA) recently approved the entire list (L. Woodruff, pers. comm.). In the Lochsa River system, all

the impaired tributaries were removed from the list. The Lochsa River and tributaries support ESA-listed steelhead and bull trout. This is just part of Idaho's and the agencies' (including EPA) long history of non-compliance with the CWA. Cooperating agencies such as the Forest Service and BLM deserve the same poor grade for their cooperative efforts in dealing with the CWA, 303 (d) streams, and TMDLs. To my knowledge, not a single impaired water body in Idaho has been restored. The SRS proposal to use CWA efforts to deal with the recovery of ESA-listed species will only result in more obfuscation, delay, and failure, and a continued effort to *remove* streams from the 303 (d) list rather than concentration on recovery.

The non-federal habitat section relies extensively on local involvement and collaboration with multiple stakeholders, generally organized under watershed councils or resource advisory councils. The intent here is to provide a forum for non-federal partners to encourage commitment and provide input regarding management of the resources. This type of provincial public linkage has a history in Idaho and elsewhere with their watershed councils and basin/watershed advisory groups. The councils and groups, however, exert a largely negative influence on the management of watersheds. They are generally staffed and controlled by local representatives of the extractive industries whose goal is the enhancement of their agendas, with minimal representation from the environmental groups. In my opinion, these local groups marginalize efforts to restore and recover watersheds, fish habitats, and populations. Frequently, they simply produce more intensive gridlock. For example, in Idaho, "resource advisory groups" and their supporters are pushing the agenda of State control and management of federal lands—primarily national forests. If this occurs, aquatic resources in the Snake Mountain Province will experience accelerated and additional degradation. The SRS' reliance on local involvement is misplaced.

The non-federal section concludes with a listing of additional federal programs, subbasin planning, watershed assessments, and a discussion of performance standards. These measures contain the same uncertainty and "*slow start*" planning that permeates the entire SRS.

The SRS contends that successful habitat recovery and watershed restoration for non-federal lands requires state and local stewardship. Upon the completion of more planning and assessment, the agencies will evaluate the efficacy of existing laws and regulations in protecting habitat. The most important problem with protecting non-federal habitat in the Columbia Basin has been state and local *stewardship*. There has not been any effective or sufficient *stewardship* to protect watersheds and habitats. In Idaho, that is exactly why so many streams ended-up on the 303 (d) list. The problems are not associated with existing laws and regulations. The problems are weak or no compliance and implementation of existing laws and regulations. In addition, there has not been any accountability associated with this situation.

In addition, while there is obviously a need for some planning, critical recovery efforts should not stop and wait for final plans. The Power Planning Council (PPC) has not yet proposed a specific process for completing proposed plans (p. 9). Again, this is not a "*fast start*." The PPC has developed a subbasin planning template. It should make a decision and go for it. Otherwise, there will be a proliferation of alternate templates and protocols that will just confuse the situation. The SRS offers some

dubious guidance for the planning process--a locally-led implementation process. This is a recipe for failure. While there should be some local involvement, the locals should not lead or dominate the process. In the Snake Mountain Province, local control does not equate to watershed or habitat health.

Similarly, the agencies contend that implementation of subbasin plans to protect watersheds and habitats should be based on voluntary, incentive-linked approaches within a regulatory context. Where has voluntary behavior ever worked to protect habitats in the Columbia Basin? The track record of this approach has been failure. Volitionary behavior has led to widespread degradation of watersheds and habitats in the Columbia Basin. What does *incentive-based approaches within a regulatory context* mean? Does it mean that if you do not get enough money (incentive) to do the right thing or obey the law—that the regulatory agencies will give you more money to do it? The laws and regulations require compliance; people and entities should not have to be paid off to be responsible.

The agencies also propose to make clearances under ESA and the Clean Water Act more efficient for landowners through programmatic consultations and other unidentified mechanisms. This guidance just makes it easier for the landowners to escape their responsibilities under ESA and CWA. The SRS presents no evidence that compliance with ESA and CWA is unduly constraining the landowners from doing anything. Programmatic consultations and mechanisms are too general and loophole-ridden to adequately protect watersheds and habitats.

In another measure, the SRS proposes to offer short-term funding for other projects. However, the guidance is too general and the objectives too grandiose. For example, the SRS proposes funding to “*address imminent risks to survival of one or more species or result in substantial, measurable benefits to species survival in not less than 10 years after implementation.*” These “projects” appear to be overall program objectives not sustainable with short-term funding. They are adequate objectives for the entire recovery program, but provide too little guidance to reduce extinction risk and enhance survival as required under the ESA.

Finally, the non-federal section concludes with a discussion of tributary performance standards. The federal agencies will develop habitat performance measures (standards) to ensure consistency among programs. While a commendable objective, the discussion and rhetoric in this section create some uneasiness and skepticism on my part. The identification of four key habitat factors that need to be linked to performance measures in tributary subbasins is a good stroke. The factors are: instream flows, amount and timing of sediment inputs to streams, riparian conditions and habitat access. Changes in these attributes can be measured at the reach or watershed level and aggregated to larger spatial scales to evaluate progress at the subbasin or basin level. However, there is potential here to play the “pea-and-shell” and “dilution” games so characteristic of previous efforts at developing watershed or habitat standards. Performance measures (standards) need to be developed at the critical reach and watershed scales. In this manner, habitat quantity and quality can be aggregated from the bottom up.

The SRS weakens its direction of performance measures by only requiring that performance standards initially be expressed as “*desired trends*” in the attributes instead of specific endpoints. This direction is too soft and discretionary. There has been ample experience with trend games in the basin. The Nez Perce National Forest uses an “*upward trend*” to avoid accountable

performance in their watersheds. The forest always cites an “*upward trend*” but never provides evidence or data of its existence. The Forest Service also uses “*desired future condition*” generally as a surrogate for “hard” standards. Few forests have developed quantitative endpoints to describe the desired conditions. The direction from the SRS should be to develop “hard” and accountable standards—not unmeasurable trends.

## **2.5 Summary of Non-Federal Section**

- The SRS calls for too much planning. This is a “*slow start*” rather than a “*fast start*” approach to recovery.
- The conceptual framework of SRS is that “tweaking the habitat” will be sufficient to recover the species in peril. Tributary habitat is not the primary limiting factor for the recovery of ESA-listed species in the subbasins of the Snake Mountain Province. Moderate improvements in non-federal watersheds and habitat will not recover the ESUs.
- The Clearwater River Subbasin has been excluded from priority consideration.
- Listing the protection of estuary habitat as one of the prime objectives of the SRS is contradicted by the COE’s (and other local entities’) proposal to extensively dredge and impact the estuary. NMFS has initially approved the project.
- The agencies have a long history of not meeting their habitat program objectives of protecting existing habitat, restoring degraded habitat and preventing further degradation. The proposed “*new strategy*” is a re-serving of failed and uncertain approaches such as: integrating ESA with the Clean Water Act and the TMDL program; putting state and local interests in charge of recovery efforts; putting the Bureau of Reclamation in charge of fixing flow problems when they lack the authority to do so; developing phony pilot programs that only delay real efforts of recovery; and relying upon voluntary, incentive-based programs to protect watersheds and habitats.
- The SRS calls for programmatic consultations and mechanisms for ESA and CWA compliance that are too general and loophole-ridden to adequately protect watersheds and habitats.
- It is commendable that the SRS will develop performance standards (measures) to ensure consistency and assess progress. Responsibility and accountability are two characteristics in short supply when it comes to recovery of ESA-listed salmonids.
- The SRS weakens its direction for performance standards by only requiring (initially) “desired trends” in the attributes instead of specific endpoints or conditions. We need hard and accountable standards—not imaginary trends.

With reference to the subbasins of the Snake Mountain Province, the most critical habitat objective is to restore mainstem migration habitat eliminated by Snake River Dams and reservoirs. This objective has not been accepted.



## **2.6 Tributary Habitat on Federal Lands**

The section on federal management of tributary habitat begins with a discourse of how important it is for the Forest Service (USFS) and Bureau of Land Management (BLM) to maintain existing high quality habitat and restore degraded areas. The federal land management agencies manage over 60% of the currently accessible spawning and rearing habitat for anadromous fish in the Columbia River Basin. The SRS states that aquatic habitat on federal and non-federal lands has generally declined in quality and quantity from historic conditions. This is classic understatement (see McIntosh *et al.*, 1994; Henjum *et al.*, 1994; and Rhodes *et al.*, 1994 for an accurate description). The SRS likewise understates that “*some federal lands have a legacy of logging, livestock grazing, road construction and mining.*” It is my experience that most federal lands that have been subjected to “land management” exhibit a substantial legacy of impacts (Huntington, 1998). The SRS states that the developed areas may currently support salmonids, but at lower than historic levels. Federal habitat that tends to be closest to historic conditions occurs in areas where little management has taken place, including wilderness and roadless areas (Huntington, 1998 and the SRS, 2000).

The SRS contends on page 12 that “[r]ecent scientific assessments indicate that overall, the habitat conditions on federally-administered lands are in an upward trend.” This is a major contention that requires detailed scrutiny to determine its veracity and credibility. In this evaluation, I cite specific examples and case histories discrediting this “upward trend.” The SRS contention mirrors that of the Nez Perce Forest: that an “upward trend” in habitat conditions is evident despite the fact that no evidence or data is presented to verify its existence. Recent data and information from the Nez Perce Forest will therefore aid my evaluation:

- Rhodes *et al.* (1994) and Espinosa (1997) have documented degradation of salmon habitat on the Clearwater National Forest (CNF) that has extended into the 1990s. Huntington (1998) has documented degraded conditions for CNF roaded watersheds extending into the mid-1990s. During the late fall of 1995 and early winter of 1996, storm events in the Snake River Subbasin precipitated over 900 landslides on the CNF further degrading habitat conditions (appendices). Other watersheds in the Snake Mountain Province were similarly impacted (Weaver *et al.*, 1998). Recent post-storm evaluations on the CNF and elsewhere have documented substantial watershed and habitat degradation (McClelland *et al.*, 1997; Pipp *et al.*, 1997; Clifton *et al.*, 1999; Viola, 1997; Espinosa, 1997; and Rhodes *et al.*, 2000). According to the Forest Service’s own data, 70% of the landslide events on the CNF were associated with logging roads and timber harvest units (McClelland *et al.*, 1997). However, this is a minimum figure as one heavily harvested and roaded district (Palouse) was not included in the analysis (Espinosa, 1997). Pipp *et al.* (1997) analyzed a number of watersheds on the Powell District of the CNF and reported that 92% of the failures were directly related to timber management. In comparing the response of areas developed with roads and timber harvests to roadless, unharvested watersheds, Espinosa (1997) documented a landslide exacerbation factor of 3.5 times that attributable to the roadless watersheds (appendices). In their study of storm responses of CNF watersheds, Rhodes *et al.* (2000) documented statistically significant degradation in substrate conditions (cobble embeddedness and % fines) and acting debris in Squaw Creek, a developed tributary to the Lochsa River. Sediment substrate conditions of the control stream (roadless) were not statistically higher in the post-storm years. In the same study, residual pool

depths (pool quality) were significantly degraded in a large tributary of the Lochsa River (Crooked Fork) following the storm events of 1995-96 (appendices). Pipp *et al.* (1997) and Espinosa (1997) also documented degraded habitat conditions in the tributaries of the upper Lochsa River following the recent storm events.

- Many of the impacts and landslides of the 1995-96 storm events were associated with the legacy effects of past management. Many old logging roads failed and delivered sediment to the streams. On the CNF, there are over 4,000 miles of logging roads. The Forest Service originally attempted to blame old road construction practices for the majority of the landslides. McClelland *et al.* (1997), Pipp *et al.* (1997), and Rhodes *et al.* (2000) were unable to document that *old* roads failed at a greater rate than *new* roads. The Forest Service was unable to substantiate their contention that their new road construction practices diminished the potential for landslides and watershed impacts.
- Watershed and habitat degradation on the CNF has persisted into the present time. There is no upward trend in habitat conditions on this national forest. Recent assessments conducted by the Forest Service provide the documentation. The project assessments conducted for the North Lochsa Face and Fish-Bate timber sales documented degraded habitat conditions in the project tributaries. A recent watershed biological assessment (CNF, 1999) documented degraded habitat conditions in developed tributaries of the Lochsa River Subbasin. Huntington (1996) has also reported a lack of an improving trend (substrate sediment conditions) for selected tributaries of the Lochsa River. The most comprehensive survey of aquatic conditions was recently conducted by the ICBEMP effort for the upper Columbia River Basin (2000). The agencies certainly did not document an improving trend on federally-managed watersheds. The following is what ICBEMP has stated in their summary section of conditions and trends (Chapter 2, page 125).
  - “Nevertheless, important aspects of stream channel stability, such as channel complexity and large wood abundance, have decreased throughout much of the project area. Aquatic species habitat features such as riffle-pool frequency and wood frequency are generally less in areas with higher road densities and in areas where timber harvest has been a management emphasis.”
  - “Most riparian areas on Forest Service—or BLM-administered lands are either ‘not meeting objectives’, ‘non-functioning’, or ‘functioning at risk’.”
  - On federally-administered lands the most pronounced changes to water quality are due to road construction, vegetation alteration (including silvicultural practices, fire exclusion, and forage production), improper livestock grazing, water diversions and impoundments.
  - “More subtle but widespread changes in water quantity on federally administered lands have probably been caused by road construction and changes in vegetation due to silvicultural practices and excessive livestock grazing pressure.”

Nowhere in the summary was there documentation of an improving trend in federal watersheds (ICBEMP, 2000).

- On the Nez Perce National Forest (south of the CNF), the “*upward trend*” contention is frequently used to rationalize additional timber and road projects in below standard (degraded) watersheds. However, no compelling evidence of an “*upward trend*” is ever presented.
- Huntington (1998) and (1999) has examined stream conditions at four monitoring stations (tributaries) on the Salmon River Ranger District and evaluated sediment monitoring on the South Fork of the Clearwater River respectively. For the Salmon River tributaries, Huntington (1998) reported that data on weighted embeddedness at each monitoring station suggest a general pattern of poorer streambed conditions (higher embeddedness) in the more recent years of sampling. Huntington (*op. cit.*) also reported that there was a general increasing trend in percent surface fines at each station, with <2mm fines significantly higher in 1995 than in 1990 at all stations, and <6mm fines significantly higher in 1995 than in 1990 in all but one monitoring station (Little Slate). These data and trends hardly support the contention of an “*upward trend*.”
- On the South Fork of the Clearwater River (SFCR), the Forest Service’s objective is to keep levels of cobble embeddedness below the range of 20-30%. Despite their monitoring program, the Nez Perce Forest (NZPNF) has failed to present an analysis of the data supporting an “*upward trend*.” They recently completed a biological assessment for the SFCR (1999). They did not report any of their cobble embeddedness data for the mainstem SFCR. They reported data for several tributaries such as Peasley (54%), Cougar (64%), American (65%), and Trout Creek (85%). These are very high levels of cobble embeddedness. The Nez Perce Forest concluded that the baseline conditions for key sediment habitat elements were at a low quality level for the SFCR (*op. cit.*). In fact, they ranked all the habitat elements at the low quality level (NZPNF, 1999).
- The Bureau of Land Management also monitors in the watershed and has reported levels of mean cobble embeddedness ranging from 23% to 40% in four years of sampling between 1993 and 1998. BLM has also core sampled SFCR substrates from 1993 to 1998 (Huntington, *op. cit.*). During this period, fines (<6.3 mm) by depth measured in the mainstem site have ranged from 34% to 52%. These levels of substrate fines indicate severely degraded habitat conditions for spawning and rearing habitats (Rhodes *et al.*, 1994). Once again, there is ample evidence of degraded conditions—not an improving upward trend.
- In the Snake Mountain Province, the South Fork of the Salmon River (SFSR) of the Payette National Forest is often used as an example of watershed recovery or improving trend in habitat conditions. The SFSR (96% federally-managed) was extensively impacted in the 1950s and 1960s by mining, grazing, timber harvesting, and road construction (NMFS, 1998). Storm events in the early 1960s precipitated accelerated erosion, landslides, and massive sediment delivery to the spawning and rearing habitats of the SFSR system. Some spawning reaches were buried with more than three feet of sediment (*op. cit.*). Timber harvest and associated roading were suspended in 1965 (Nelson *et al.*, 1997). Efforts to reduce the sediment began in 1969. In 1983, the Forest Service discontinued scheduled timber harvests. During the 1970s, there was some evidence of partial recovery (Platts *et al.*, 1989). However, it still has not fully recovered (Rhodes *et al.*, 1994). The Forest

Service resumed timber harvest in 1996 under the timber rider (Public Law 104-19). The degraded condition of the SFSR is well documented in recent reports, NMFS opinions, and scientific literature. However, there are some contradictions in recent reports written by the Forest Service versus the biological opinion written by the NMFS.

- I have reviewed the monitoring reports by Nelson *et al.* (1996 and 1997). In 1996, Nelson *et al.* (1996) analyzed sediment trends and monitoring efforts for the period 1983-1995 on selected streams of the Payette National Forest (PNF). The 1996 analysis and report looked at sediment conditions in relation to mining areas in the East Fork, South Fork Salmon River (EFSFSR) and the Big Creek watersheds. In 1997, Nelson *et al.* (1997) reported on sediment trends and monitoring efforts during the period of 1977-1996 for the South Fork Salmon River (SFSR) and selected tributaries plus streams in the Chamberlain Basin. For both reports, Nelson (*op. cit.*) concludes that there are improving trends in sediment conditions for the study streams. In the 1997 report, Nelson (*op. cit.*) states on page 54, “*With respect to the first objective, demonstrated improvement in sediment conditions, we believe we have shown approximate compliance.*” Upon review, there is no persuasive evidence that there is an improving trend in the SFSR system. There are too many serious problems with the data and analysis to make such a pretentious conclusion. The Authors themselves point out the many deficiencies in the data and analysis. The following is a partial list:
  - 3% error rate in free matrix particle data.
  - 5% error rate in cobble embeddedness (CE) data.
  - No site had a complete record. There is data missing for critical periods such as 1991 to 1995.
  - There is no assessment or data that includes post-flood impacts in the SFSR.
  - Authors acknowledge data entry and measurement problems.
  - Impacts associated with the SFSR Road have not been regularly monitored.
  - There is only one long term monitoring site in the lower SFSR area.
  - For the most important spawning area in the SFSR—Poverty Flat—despite some annual variation, the level of large fines in 1996 was nearly identical to that from 1977 and was higher than the 20-year average for the site (p. 30, Nelson *op. cit.*).
  - Although mean cobble embeddedness has fluctuated over the study period, there is little evidence of any trend in the various watersheds. (Nelson *op. cit.*, p. 27).
  - Results of monitoring cobble embeddedness for the SFSR road are inconclusive.
  - In their analysis, the Authors did not account for variance associated with predicting values of cobble embeddedness from free matrix data.
- A very similar situation exists with the report on sediment conditions for the mining areas of the SFSR (Nelson *et al.*, 1996). The Forest Service concludes that “*[i]t appears from the analysis in this report that sediment mitigation measures in the three mining areas considered have largely been effective in controlling sediment delivery from the mines, and are probably reducing sediment in most areas affected by the mines*” (p. 69). In my opinion, there has been no real analysis of management effects on sediment conditions in these areas. The

conclusion by the Forest Service is a leap not supported by the evidence, analysis, or data. The data, analysis, and report all contain major problems. The following is a partial list of these problems:

- The Authors acknowledge a data entry and validation error of 5%.
  - On page 15, the Authors concede that “[t]here has been little standardized data collection, entry, and maintenance protocols...”
  - There are significant questions concerning the accuracy of CE measurements in the Wilderness areas.
  - There are missing blocks of data.
  - There are major geological differences between watersheds.
  - There are major problems with the CE data for the period of 1992-1995.
  - There was no significant correlation between CE and free matrix particle for data pooled over all sites and all years.
  - The analysis was conducted prior to the flood impacts of 1996-97.
  - There has been no analysis of the effectiveness of the mitigation efforts and practices.
- Improving flow regimes in 1994 and 1995 may be responsible for moving more fines out of the areas—instead of the mitigation efforts.

- The Forest Service’s reports on sediment conditions in the SFSR are contradicted by a recent biological opinion written by NMFS for the lower SFSR. Actually, the Forest Service’s own data and analysis indicates that there is no “*improving trend*” in sediment conditions for the SFSR. Most recent SFSR sediment monitoring data (1996) indicate sediment concentrates are on the average above the 20% threshold level; and moreover, conditions have worsened since the 1997 storm and flood events (NMFS, 1998). The storm and flood events of late December 1996 and early January 1997 caused considerable damage within the SFSR. Flooding, hillslope, and road failures contributed to widespread sediment increases (NMFS, 1998). On July 18, 1997, the Payette National Forest provided supplemental documentation to NMFS with reference to the storm events of 1996 /1997 and the lower South Fork. The document indicated: “*The baseline condition in the lower SFSR watershed was altered by the flood events. Numerous debris flows and bedload movement within the channels have severely altered the condition of the fish habitat. . .The impacts created by the 1997 rain-on-snow event have effectively raised the baseline sedimentation of the subwatersheds analyzed in the LSFSR Post-fire Project DEIS.*”

In their final comments to the recent lower SFSR Biological Opinion (1998), NMFS pointed out some significant situations that will continue to adversely impact the SFSR system. NMFS has documented unstable conditions along the main SFSR road (streamside). A 1997 field review documented flood damaged road conditions that included erosion, debris flows, slumps, washouts, fill failures and continued undercutting of the asphalt surface. NMFS concluded that many of the protective measures outlined in the biological opinion and land resource management plan have not been implemented (*op. cit.*). Current sediment levels exceed NMFS’ opinion standard and are considered to reduce egg-

to-fry survival rates. The SFSR watershed was highly impacted in the 1950-1960s, and some 30 years later, egg-to-fry survival rates have not returned to predisturbance condition (NMFS, 1998).

**Epilogue:** The Payette Forest has completed two recent reports on monitoring and sediment trends in the SFSR (Nelson et al., 1999 and Nelson and Burns, 1999). I have reviewed these reports. These reports include post-flood monitoring and data for 1998. In pursuit of the "improving trend," the Forest Service has placed a "best case" spin on the data and analyses. However, there is no compelling evidence or documentation that conditions are as "favorable" as they contend. Two major spawning areas-Dollar and Glory sites-show increases in sediment levels in 1998. In fact, their data shows that since 1994-streambed sediment conditions have further degraded (upward trend in coarse and fine sediments) at all SFSR sites (coring data; Nelson et al., 1999). Their interpretation is that subsurface sediments appear to be stable although their data does not support this contention (Figure 27, p. 29; *op. cit.*). Moreover, in this most recent analysis-sampling locations were different in 1998 than 1997 (p. 15, Nelson et al., 1999).

The other report on cobble embeddedness and free matrix sampling (Nelson and Burns, 1999) still suffers from the sampling, quality control, data and analysis deficiencies described above. However, their best information shows that for the upper SFSR sites, the percentage of free particles in the streambed was noticeable lower in 1998 for all sites and was at its lowest level of the monitoring period (p. 19, *op. cit.*). The Forest Service further concludes that few sites appeared to have lower cobble embeddedness in 1998 than in 1996 and those that did appear to be less were only slightly so (p. 35, *op. cit.*).

With reference to the SFSR and the Forest Service contentions, the only one that I agree with is that current streambed conditions are not as bad as those in the late 1960s. However, considering the severity of the conditions in the 1960s, a comparison against the current status is hardly a valid index of excellence or optimality. Conditions in the South Fork Salmon River have not recovered to pre-impact levels. Any proposal to re-enter the SFSR with more timber harvesting and road construction is premature and not warranted by existing conditions. Such proposals place the risk on the habitat and ESA-listed species.

- The Bureau of Land Management has recently completed a watershed and habitat assessment in the Little Salmon River (LSR) Subbasin (Johnson, 2000). The LSR flows into the main Salmon River at Riggins, Idaho and provides habitat for spring/summer chinook, steelhead, and bull trout. Sixty percent of the watershed is under federal management (4% BLM and 56% Payette N. F.). The LSR has a long history of mining, logging, grazing, road construction, and floodplain development (*op. cit.*). Johnson (2000) and Espinosa (1998) have documented cumulative effects in the system. The LSR system suffers from watershed and channel instability, adverse temperature regimes, severe bank erosion, excessive bedload sedimentation, and poor riparian habitats

(*op. cit.*). The LSR was also severely impacted by the storm events of 1996/1997 (Espinosa, 1998). Johnson (2000) states in his assessment:

*Recent and past flood events have contributed to adverse channel and riparian impacts. The lower canyon river reaches are in a state of disequilibrium while the river adjusts by reworking alluvial deposition and builds new stream banks. The upper valley reaches have a large amount of unstable streambanks, primarily attributed to cattle grazing; while the lower reaches have unstable streambanks which are primarily attributed to flood events.*

- Recent assessments in the LSR do not indicate an “improving trend” in watershed and habitat conditions (Espinosa, 1998 and Johnson, 2000). The LSR is a mixed ownership watershed that is continually impacted by a variety of activities associated with private, state, and federal actions. The SRS promotes the illusion that private (local), state, and federal entities will work cooperatively to recover watersheds like the Little Salmon. Espinosa (1998) in his biological assessment reported that the “stakeholders” in the drainage have not worked together to develop and implement a recovery plan for the LSR and in fact are continuing to impact the system with more roads, grazing, floodplain development, and timber harvests. While the BLM has moderated their grazing and timber programs in the subbasin, the State of Idaho and the Forest Service continue to propose multiple timber sales in the watershed (Espinosa, 1998).
- In the search for an “improving trend” on federally-managed landscapes, I have reviewed information and data from areas outside of Idaho. The northern Blue Mountains were also hit hard by the storm events of 1995/96 (Fitzgerald and Clifton, 1997). In addition to flooding, the storms triggered debris flows and slides on the Umatilla National Forest (UNF). Roding and logging were associated with 37 % of the observed mass wasting features (*op. cit.*). High flows and mass wasting combined to produce a variety of channel responses including: scouring of substrate and banks; aggradation of sediment; accumulation of large woody debris; and lateral channel migration. In roaded watersheds, a sample of culverts at stream-road crossings indicated about 50% of the culverts failed (*op. cit.*). Culvert failure caused additional damage to roads and streams. Rhodes *et al.* (2000) and Viola (1997) have documented damage to fish habitats in their post-flood assessments in the Tucannon River watershed.
- I have reviewed information compiled on salvage logging of the Summit Fire on the Malheur National Forest (MNF) (Weber, 2000). About two years ago, the MNF proposed logging on approximately 6,700 acres of the area burned by the “Summit Fire” in the tributaries of the Middle Fork, John Day River (MFJD). These tributaries provide habitat for chinook salmon, steelhead, and bull trout that were damaged by logging, grazing, and mining prior to the fire. At the time the project was proposed, all the streams in the project area failed to meet the forest plan standards for fish habitat conditions which the MNF is legally required to meet. During consultation, the ESA regulatory agencies (USFWS and NMFS) went along with the Forest Service and determined that there would be no problems. *This is a good example of the “working together” scenario promoted by SRS.* The project was appealed by the Umatilla and Warm Springs Tribes plus the Columbia

River Inter-Tribal Fish Commission (CRITFC) and subsequently litigated unsuccessfully by an environmental organization. A CRITFC Hydrologist, Jon Rhodes, recently reviewed the project site and conditions (Weber, 2000). The following is a summary of his observations and conclusions:

- *“In aggregate, this is one of the most poorly executed logging operations I have ever inspected in my 11 years of looking over logging shows. It is unquestionable that the SFP [Summit Fire Project] has damaged watersheds in ways that will take decades for recovery and centuries for full recovery. The streams, fish habitats, water quality, wetlands, and other aquatic resources have been degraded by the project’s effects.”*
- *“Every reconstructed road crossing that I encountered had greatly increased sediment delivery to streams (>10 cu. yds) since reconstruction. In all cases, that I encountered, sediment delivery was likely to remain extremely high over the next several years. The bulk of the sediment delivered at these points was fine sediment that damages fish habitat and increases turbidity.”*
- *“Over-road flow was ubiquitous on reconstructed roads, contrary to the FSEIS’s assertion that reconstruction would improve road drainage. In the vast majority (>85%) of cases that I encountered, over-road drainage went directly into streams or tributaries. In every case encountered, reconstruction of road crossings greatly increased both overland flow and sediment delivery, usually in an extreme fashion.”*
- *“Soil damage (displacement, rutting, and puddling) was ubiquitous on skid trails; skid trails were commonly placed in or across swales; most of these were flowing water when inspected, or had obviously had flowing water.”*
- *“Sidecasting/placement of fills from road reconstruction into streams and floodplains was common throughout the SFP.”*
- *“Although the EIS’s claimed that road reconstruction and rocking would reduce sediment delivery on reconstructed roads, the inspection indicated that an extremely small fraction of the length of reconstructed roads have been rocked; the fraction is well under 0.1% (i.e., less than one tenth of one percent of the reconstructed road length inspected has been surfaced with rock).”*
- *“The mitigation efforts that the EIS’s asserted to be effective, were in no cases effective. The sandbags, silt fences, and hay bales that I inspected did nothing significant to reduce or arrest sediment transport and overland flow. Significant rutting was common on most reconstructed roads. All landings that I inspected had severe rutting, soil displacement, and soil damage.”*
- *“Logging in wetlands and within the stream buffer distances prescribed by PACFISH was relatively common, contrary to the EIS.”*
- *“The damage caused by the logging is certain to thwart efforts to rebuild salmon and steelhead runs in the Middle Fork, John Day River, inconsistent with USFS’s stated objectives under PACFISH... Fish habitat productivity has been severely reduced.”*

This review is hardly a testament to the contention that efforts at federal land management and agency cooperation are characterized by an “improving trend”.



- A similar review was conducted on the Umatilla National Forest for the Tower Post-Fire Logging Project (TPLP) by Jon Rhodes (1999). Mr. Rhodes observed and recorded the following observations in his declaration (Civ. No. 98-98-AA):
  - *“My recent review of field conditions does not alter the conclusions in my previous declarations about the negative effects of the TPLP on aquatic resources, including water quality, fine sediment, groundwater, salmonid habitat, and salmonid survival. In fact, field conditions clearly corroborate all of the conclusions in my previous declarations.”*
  - *“It is obvious from my most recent field review, together with my pre-activity reviews that, contrary to the predictions in the TPLP environmental assessment, the effects of the TPLP have been far more damaging to affected streams than the Tower Fire itself.”*
  - *“Based on my field reviews of pre-and post-project conditions, road use and reconstruction, skid trail development and use, landing use and construction, and logging have cumulatively caused increased erosion and stream sedimentation and severely damaged and disrupted soils and groundcover.”*
  - *“It is already obvious that the activities conducted as part of the TPLP have greatly elevated stream sedimentation, which will contribute to pool loss and elevation of water temperatures via increases in channel width/depth ratios. Due to the extent, intensity, and locations of soil and vegetation damage caused by project activities, the effects of this damage will continue to degrade salmonid habitats for years and delay habitat recovery.”*
  - *“It will not be possible to immediately eliminate on-going damage to water quality and salmonid habitat, even if expensive mitigation were implemented. This damage is significant because many of the affected streams that provide salmonid habitat were already previously degraded by the cumulative effects of roads, logging, and grazing.”*

These observations of the Tower Post-Fire Logging Project do not validate the assertion that federal management is improving and that as a result—habitat conditions are improving.

- Mr. Jon Rhodes (pers. comm., 2000) is conducting a grazing study on selected watersheds of the Wallowa-Whitman N. F., Umatilla N. F., and Malheur N. F. Results to date indicate that existing grazing is at least severely retarding the recovery of bank stability, channel width, and vegetative ground cover. The investigators have also observed that significant on-going grazing damage is occurring widely on federal lands throughout the John Day and Joseph Creek/Hell’s Canyon Area (Rhodes, pers. comm.).
- A recent court case in the Umpqua River Subbasin (Oregon) also illustrates the lack of “real” change (adaptive management) on part of the federal agencies to improve management on federal landscapes and habitat conditions for ESA-listed species.
  - **The Umpqua Example:** 24 federal timber sales have been proposed by the forest service and BLM for the Umpqua River Subbasin. The Umpqua cutthroat trout and

coastal coho salmon supported by the Umpqua River system are listed as threatened or endangered under ESA. Management of aquatic resources within the subbasin is governed by the aquatic conservation strategy (ACS) of the Northwest Forest Plan. This is a management strategy very similar to the ICBEMP template. Like ICBEMP, it calls for analysis at multiple landscape scales. The Umpqua timber projects were contested and litigated by a coalition of environmental and fishing groups. During the litigation, it was established that the proposed sales would degrade the habitat conditions at the project or site-specific scale or level. The analysis documented that many of the habitat attributes were functioning poorly or at risk. The Court ordered the land management agencies to document compliance with the ACS and reconsult with the National Marine Fisheries Service (NMFS). During the reconsultation phase, the agencies including NMFS refocused their criteria for assessing ACS compliance in a manner that gave the appearance that ACS compliance was being achieved, rather than engaging in a meaningful analysis of ACS compliance at the project scale. The agencies intended to mask or ignore evidence that the proposed timber sales would not “maintain or restore” habitat conditions, as mandated by the ACS. During this process, the agencies backed away from ensuring ACS consistency at the project level and instead used analyses directed at the 5<sup>th</sup> field watershed (20 to 200 square miles) to determine ACS consistency and jeopardy (“the pea-and-shell-game”). Secondly, they stated that few if any timber sales would produce measurable impacts on such a large scale (“the dilution” gambit). Third, by determining ACS consistency on a 10-20 year period, the agencies ignored the sales’ near-term impacts on fish survival and recovery. Fourth, the agencies ignored conditions on non-federal lands in assessing the cumulative watershed effects of additional logging; and lastly, the agencies ignored watershed analysis and riparian reserve violations.

The Court decided that the agencies including NMFS are required by the Northwest Forest Plan and the Programmatic Biological Opinion to ensure ACS compliance at all four spatial scales (my emphasis). The Court stated that the decision to measure ACS compliance only at the large watershed level and its failure to evaluate ACS compliance at the project or site level was arbitrary and capricious. The Court further concluded the failure to evaluate short-term impacts (*i.e.*, impacts that would manifest in less than a ten year period) was also arbitrary and capricious. In light of the overwhelming evidence of the ongoing degradation to the habitat of the endangered aquatic species in the Umpqua River Subbasin, the Court found that the agencies’ approach was not rationally calculated to achieve the goals of the ACS (Rothstein, U.S. District Judge, Order No. C99-67R, September 29, 1999). The Court granted the plaintiffs’ motion for summary judgment and stopped the timber sales from being implemented. The federal agencies have since appealed the decision to the 9<sup>th</sup> Circuit

Court of Appeals. One can hardly describe this appeal as a strong commitment to aquatic resources, the Endangered Species Act or adaptive management.

In my opinion, this unequivocally illustrates the total lack of commitment on part of the land management agencies and the ESA consulting agencies to change despite all the promises and planning. Their mad dash to produce board feet at the expense of endangered aquatic resources can scarcely be described as adaptive management.

The SRS blatantly declares that “[r]ecent scientific assessments indicate that overall, the habitat conditions on federally-administered lands are in an upward trend.” However, the SRS has not displayed any evidence, data, assessment, or analysis that this is true. To the contrary, I have presented evidence and data from several national forests in the Snake Mountain Province and elsewhere which indicate that this is simply not a valid or truthful statement. If anything, habitat conditions in developed federal watersheds remain degraded or have worsened.

The foundation of SRS’s assertion that federal management will restore and improve watershed and habitat conditions in the Columbia Basin is based on ICBEMP—the Interior Columbia Basin Ecosystem Management Project. The implementation of this strategy has been delayed because there is a perception among some politicians and their industrial supporters that ICBEMP is too biased towards amenity resources. This perception persists despite the fact that ICBEMP calls for an increase in the harvest of timber (ICBEMP, 2000). In the interim, federal landscapes are managed under the PACFISH/INFISH strategies and their related biological opinions. NMFS and the USFWS have concluded that PACFISH/INFISH strategies are sufficient to avoid jeopardy and will conserve recovery options until long-term restoration strategies are adopted. While PACFISH/INFISH do establish goals, objectives, and riparian management areas, similar planning efforts indicate that it will not lead to better management. In addition, these interim strategies plus their replacement—ICBEMP—are based on the failed management concept of *best management practices (bmps)*. Rhodes *et al.* (1994) and Espinosa *et al.* (1997) have documented the failure of this concept to adequately protect salmon habitat in the Snake River Subbasin and Clearwater National Forest respectively. The strategies interpret the concept as a vehicle for management standards. Bmps are not management standards. They are not quantitative, accountable standards. They are practices ostensibly designed to minimize impacts on aquatic resources. However, they are frequently *least management practices (lmps)* that do not feature the protection of the aquatic resource as the prime objective. They also do not deal with cumulative impacts. In fact, they encourage cumulative impacts since the adoption of any *bmp* is deemed sufficient consideration despite existing resource conditions.

A recent court case on the Clearwater National Forest illustrates the inherent weakness of the *bmp* concept to adequately protect aquatic resources (CV-97-208-M-LBE, decided July 20, 2000). The plaintiffs challenged a large timber sale on the breaks of the North Fork, Clearwater River (Fish-Bate Project). The Forest Service contended that their *bmps* would be adequate to protect the aquatic resources despite degraded baseline habitat conditions that were further impacted by landslides in 1996. The INFISH strategy was the cornerstone of the Forest Service’s *bmp* package. The Forest Service stated that their INFISH riparian strategy would be sufficient to protect the resources. They presented no evidence of this contention. The Court decided against the Forest Service and concluded that their *bmps*, including INFISH, were not assessed for the effectiveness against landslide events. The Court decided that the Agency’s reliance upon *bmps* to totally mitigate environmental impacts and have no effect on aquatic

resources was arbitrary and capricious. It thus reversed and remanded the agency conclusion that the *bmps* would prevent adverse effects (Erickson, 2000). The *bmp* concept has been the prevailing management theme in the West during much the widespread watershed and habitat degradation. Despite its universal failure to adequately protect resources, it continues to this day to be the prevailing theme embedded in PACFISH/INFISH and ICBEMP. As the above case illustrates, the *bmps* in INFISH have no basis and cannot be relied upon to mitigate adverse effects.

I have reviewed the ICBEMP strategy in detail (Espinosa, 2000). My summary comments and critique are presented in the following elements.

- No monitoring plan has been developed for ICBEMP. Considering its broad and discretionary goals, objectives, and standards, the land management agencies need monitoring direction and oversight. The history of monitoring watershed and fish habitat conditions by the agencies has been abysmal. ICBEMP provides little funding or leadership commitment to change this situation.
- The watershed condition indicators (WCIs)—the monitoring parameters, framework and protocol—to be used to evaluate conditions in the special watersheds have not been developed or presented in the ICBEMP document. Ostensibly, these indicators will be surrogates for watershed and/or habitat standards. Based on the historical track record and ICBEMP philosophy, nothing tough, specific or accountable can be expected.
- ICBEMP talks in length about restoration. However, priority and existence of restoration funding in BLM and Forest Service budgets have been more mythical than realistic. There is no evidence that substantial increases in funding will be available for prescribed burning, road obliteration, watershed and fish habitat restoration. What happens when it does not materialize?
- The aquatic conservation strategy (ACS) provides direction for the riparian conservation areas with reference to the Clean Water Act (CWA). The CWA mandates the Forest Service and BLM to protect and restore the quality of public waters under their jurisdictions. The agencies have developed a standard (B-S45) for ICBEMP (Chap. 3, pp. 78-80) that addresses this issue. The standard directs the use of a protocol developed by the agencies to deal with impaired (303-d) waterbodies. The protocol includes three key components: goals, strategy, and decision framework. The intent of the protocol is to be proactive in restoring impaired waterbodies managed by the land management agencies as well as to collaborate with other ongoing efforts to restore water quality on all lands. I noted earlier the State of Idaho's misuse of its leadership role in dealing with 303 (d) listed waterbodies and efforts to remove such waterbodies from listing rather than restore them. ,Based on ICBEMP's language and protocol, this situation will not change anytime soon. There will be a continued effort at removing streams from the list instead of concentrating on their recovery.
- The baseline assessment in ICBEMP did not mention the basin-wide impacts caused by the storm and flood events of 1995-96. There was widespread damage to watersheds in the Columbia Basin from these events (Weaver and Hagans, 1996; Weaver *et al.*, 1998; Clifton *et al.*, 1999; Viola, 1997; Espinosa, 1998; and Cundy and Murphy, 1997). In many watersheds, existing conditions have been further degraded (Pipp *et al.*, 1997, Viola, 1997, and Espinosa, 1998). There has been no

comprehensive assessment of these impacts in the Columbia Basin or any specific subbasin. The baseline assessment of watershed conditions in ICBEMP is now out-dated and in need of revision.

- A recurring theme in ICBEMP is local involvement and collaboration with the public via Resource Advisory Councils (RACs) and Provincial Advisory Committees (PACs). The intent here is to provide a forum for non-federal partners to provide input and influence regarding management of federal lands. I have already commented on the fallacy of this approach in the non-federal section of this critique.
- In the draft supplemental EIS and summary for the Interior Columbia Basin, land management agencies discount their efforts to recover depressed and ESA-listed populations of anadromous fish (DEIS, Chap. 2, pp. 162-163 and summary, p. 22). The Northwest Power Council, BPA, and NMFS are counting on the manipulation and improvement of watersheds and fish habitat to recover ESA-listed salmon and steelhead. The hydropower agencies postulate that improvements in the habitat can overcome the mortality associated with the hydropower system. They have advanced this hypothesis in lieu of supporting the option of dam breaching. **The land management agencies disagree. They state in ICBEMP: “Rehabilitation of depressed populations above several dams cannot be accomplished via federal habitat improvement alone but will require improvements in migration corridor survival and efforts to address causes of mortality in other life stages.”** After reviewing the ACS in ICBEMP, I do not think that the hydropower agencies can count on much watershed and habitat improvement. The history in the Snake Mountain Province evinces that improvements have failed to occur to any significant extent.
- ICBEMP has described the basin’s baseline conditions for aquatic resources: most stream channels are in a somewhat “unnatural” condition, with habitat conditions that are less than optimal for aquatic and riparian-dependent species (Chap. 2, p. 127); 60% of the historical wetlands remain (Chap. 2, p. 128); in the western United States, 66% of inventoried BLM-administered riparian areas are either “non-functioning” or “functioning at risk” (Chap. 2, p. 132); habitat available to bull trout has been fragmented, and in many cases, entirely isolated (Chap. 2, p. 146); *most existing strong populations of westslope cutthroat trout are largely in roadless and wilderness areas or national parks, suggesting that human disturbances have influenced distribution and abundance* (Chap. 2, p. 149); despite their broad distribution, relatively few strong resident redband trout populations exist (Chap. 2, 152); within their current distribution, few healthy wild steelhead populations exist (Chap. 2, p. 156); and finally, about 75% of historically accessible streams are no longer accessible to chinook salmon (Chap. 2, p. 157).

Despite this dire description and situation, ICBEMP and its ACS offer no plausible solution for recovery. I have yet to witness the recovery of a single watershed with discretionary, and non-accountable management. ICBEMP is a return to the past.

## **2.7 Revisions for ICBEMP**

*F. Al Espinosa, Critique*

ATTACHMENT 6 to CRITFC Comments

Page 21 of 32

If the agencies are going to use ICBEMP as their SRS foundation for improving watersheds and habitats, they need to incorporate the following revisions:

- Support President Clinton's Roadless Initiative by allocating a roadless management prescription, in perpetuity, to all roadless areas and to those with a low road density.
- Adopt the Coarse Screening Process with its watershed and biologically based habitat standards for all the subbasins within the Basin (Rhodes *et al.*, 1994). The procedure can easily be adapted for species other than salmon—*i.e.*, steelhead and bull trout.
- Identify and designate other aquatic strongholds (A1 subwatersheds) in the basin.
- Identify and protect critical connections (stronghold linkages) required to preserve and conserve, terrestrial (T) watersheds, A1 and A2 subwatersheds.
- Design and adopt a management standard that does not allow further development entry into subbasins and watersheds that are degraded and do not meet forest plan or CWA standards. Recovery to optimum conditions must be documented before additional impactful activities are allowed. True restoration activities such as road obliteration are permissible.
- Allocate key roadless watersheds to the primary management of fish resources (*e.g.*, White Sand and Fish Creeks in the Clearwater National Forest).
- Remove RCAs from the suitable timber and grazing landbases.
- Drop the RACs and PACs as a management element and *ad hoc* management team. Local "resource" groups have ample political influence and consideration already.
- Develop, emphasize, and embrace a National perspective to the management of Columbia Basin resources.
- Develop, emphasize, and embrace a "risk-adverse" philosophy in dealing with the management of aquatic resources.
- Develop a strategy to increase funding for watershed and fish habitat restoration that is not linked to timber harvesting and livestock grazing. Provide for an equitable allocation of funding for the amenity resources.
- Drop the "chicken-little" philosophy and propaganda in reference to wildfire, insects, and diseases. These are natural ecosystem processes.
- Design and implement a monitoring program that measures "hard" accountability standards—not broad-based "motherhood" measures.
- Drop the "loophole" philosophy in the management of federal lands.

The likelihood that ICBEMP and its companion ACS will improve forest management in the Snake Mountain Province to benefit aquatic resources is improbable and imaginary. Recent examples of its application—as illustrated by Umpqua, North Lochsa Face, and bark beetle projects—reveal its lack of commitment to aquatic resources (Espinosa, 2000). In the name of ecosystem management, degraded watersheds, fish habitats, and endangered species are dealt

another series of impacts and forced to assume all the risk. Although existing forest plans and strategies have their shortcomings, their quantitative standards/objectives allow others to force accountability and restraint. However, if ICBEMP is approved and implemented in its present form, the critical elements in existing land management plans that favor aquatic resources will be eliminated and replaced with illusory consideration. This will surely lead to further impairment of watersheds, fish habitats, and populations. The NW Power Council, BPA, and regulatory agencies cannot depend on ICBEMP to save endangered species.

## **2.8 Near-Term Priorities**

The SRS states (p. 13) that for the near term, the land management agencies have chosen seven subbasins in the Columbia Basin as high priority for anadromous fish habitat restoration. The program would begin in 2001 and is based on information developed by ICBEMP. It would feature cooperative agency ventures and strong working partnerships to restore watersheds and habitats. **The major problem with this program is that it excludes the subbasins in the Snake Mountain Province.** The federally-managed watersheds and habitats of the Clearwater and Salmon River Subbasins are not part of this near term program. The SRS rationalizes selection of the subbasins with the criterion of *“they are below the four Snake River Dams, with a strong likelihood that they will have sufficient adult escapement for optimum utilization of restored habitat.”* According to the SRS (p. 17), the subbasins *above* the four Snake River dams were given a lower priority for investments in habitat restoration projects because adult anadromous fish escapement during the last decade has not been sufficient to seed existing federal habitat. The agencies consider, generally, that the available habitat on federal land is in good condition. Approximately 70% of the priority watersheds with listed anadromous fish are in wilderness or roadless areas. Because of poor escapement, the agencies consider the improvement of habitat conditions on federal land a very marginal operation that would produce very few additional fish.

The exclusion of the Snake Mountain Subbasins demonstrates the typical downriver, short-sighted perspective that has a long history in the Columbia Basin. Idaho (upper Snake River) stocks of ESA-listed species are some of the most endangered in the Basin. The primary source of mortality is the four Snake River Dams and their reservoirs (Nemeth and Kiefer, 1999). For the past several decades, recovery efforts have been embedded in a mechanistic foundation (*i.e.*, based on engineering and technology), and these efforts have failed to achieve recovery (Nemeth and Kiefer, 1999). The recovery efforts have not only failed to recover Snake River stocks of salmon and steelhead, but they have not even halted the decline (*op. cit.*). Now, the entities responsible for recovering the species in peril such as NMFS, BPA, COE, and NWPPC respond to this failed effort by offering the Snake Mountain Province the same failed approach in the guise of a "new" Salmon Recovery Strategy. While purporting to engage in “aggressive” actions within the habitat, hatcheries, harvest, and hydropower systems, the “aggressive” action in the hydropower system excludes the adoption of the dam breaching option. Instead, it relies on measures under the other H’s while at the same time indicating that there will be no habitat efforts in Idaho for the near term because the Salmon and Clearwater Subbasins have so few fish. Since the natural river option (dam breaching) has been rejected as a replacement for the same old techno-mechanistic machinations--and Idaho Subbasins (federal tributary habitat) do not meet high priority criteria for

recovery efforts one is forced to conclude that ESA-listed species in the upper Snake River have basically been written-off.

Nemeth and Kiefer (1999) concluded their analysis of the situation by stating: *“Across all uncertainties, natural river-based solutions produced the highest probabilities of recovery, with the least risk for failure, within 24 years (Marmorek et al., 1998). . . Any genuine attempt to recover these fish must be associated with restoring some level of pre-dam ecosystem function to the lower Snake and/or Columbia rivers by providing a more-natural, free-flowing river.”*

## **2.9 Mainstem Habitat**

The SRS articulates a rather healthy section on mainstem habitat (p. 20-23). However, while recognizing its obvious importance to recovery of the stocks, it offers only more research, study, monitoring, modeling, and planning. This section offers only displacement behavior, delay, and a continuation of the *status quo*. Again, there is too much emphasis on study and planning; we already know how important the mainstem habitat is for the survival of the salmonid stocks. Because of the dams and reservoirs, it is the major disconnect in the ecosystem. What is needed is the restoration of mainstem habitat via the elimination of dams and reservoirs. We already know that the breaching of the four Snake River Dams offers the highest possibility of recovering the threatened and endangered salmon and steelhead of the Snake Mountain Province. To suggest that we need more research and study to document the obvious is simply another delay tactic. If the agencies want to expend more funding on studies, they should be investigating and developing strategies to breach the Snake River Dams.

## **2.10 Estuary Habitat**

The SRS recognizes the value of estuarine habitat and briefly documents its widespread loss and degradation. A partial listing of impacts and sources of degradation includes: construction and operations of the federal hydropower system in the upper portion of the river, construction and filling of wetlands and other developments that have caused extensive loss of tidal swamps, marshes, emergent/forested wetlands, isolated tidal channels, reduced total sediment discharge by one-third, increased potential for salmon predation through disposal of dredged material, degraded water quality, and altered natural flow regimes. These impacts plus others all constrain salmon production (SRS, p. 24). With this background, the SRS then illogically offers more study, research, and planning.

The estuary habitat section also comes across as extremely hypocritical. The Action Plan (p. 25) starts with the statement that *“[e]stuary protection and restoration must play a vital role in rebuilding the productivity of salmon runs throughout the Columbia Basin.”* In perfect contradiction, the “hydro-agencies” (COE, BPA, NMFS) and local entities (stakeholders) have proposed and supported an extensive dredging project in the Columbia estuary. The COE has developed a plan to deepen the navigation channel of the Columbia River from 40 to 43 feet. The project would cover over 100 miles of the Columbia and Willamette Rivers and involve the removal of over 191 million cubic yards of sand.



In addition, the COE would use high explosives to blast through bedrock in the river. All of this material would have to be dumped on farmland, wetlands, and streamside forests, as well as in the nearshore marine habitat just off the mouth of the Columbia River. The adverse effects of such a project are obvious, yet in their EIS, the COE concluded that there would be no significant environmental impact. NMFS also initially issued a biological opinion (BiOP) on the dredging that stated that there would be *no jeopardy* to ESA-listed species. This blatantly contradicts the SRS' conclusion that the estuary is of high value and priority to salmon recovery and survival. Although NMFS withdrew its favorable dredging BiOp to re-consider options and new information (Columbia Basin Bulletin, 2000), it did so under threat of litigation and it is my experience that when agencies fall back to consider “new information” *vis-à-vis* potential litigation, it is not to change the decision for the better but to attempt to bulletproof the original decision. I fully expect the dredging project to proceed despite the latest setback.

With respect to the estuary and its critical importance to the recovery and survival of salmonid species, the agencies and local entities are speaking out of both sides of their mouth. If this is an example of the “new strategy” for cooperative recovery efforts, then the ESA-listed species are in deep trouble. This sort of contradictory lunacy has been occurring too frequently within the basin, perpetuating the *status quo* and increasing the probability of extinction.

## **2.11 Coordination**

In synchronization with their “new” philosophy, the agencies will stress *coordination* at more extensive and effective levels. While it is obvious that there is a need for more effective coordination, the track record of success is rather abysmal. The estuary and ICBEMP projects are recent examples of failure to effectively coordinate. The SRS proposes to remedy this weakness with a Federal Habitat Team (FHT). The basin needs another layer of bureaucratic team like it needs another dam to promote recovery of salmon and steelhead. We already have the NWPPC, BPA, COE, BLM, USFS, CBFWA, NMFS, ISP, watershed councils, RACs, PACs, the States, the Tribes, and other local entities. We do not need a FHT to now coordinate and guide recovery efforts. It would be a simple matter to designate an existing entity like CBFWA or ISP to take on these tasks.

Rather than a new “team”, coordination and recovery efforts need a strong accountability mechanism for senior staff and decision-makers of agencies involved in management of Columbia Basin fish resources. When objectives are not attained, when recovery does not take place, when poor decisions impact resources, and when the result is further delay and obfuscation—those responsible should be held accountable. Performance elements of senior agency line and staff personnel should include specific objectives to recover ESA-listed species and critical habitats. Leadership personnel in the Northwest Power Planning Council should also be held responsible for their actions or inactions.

## **2.12 Analysis of Habitat Element: Tributary Subbasins and Estuary**

This section begins with the contention that an effective habitat program could significantly improve tributary habitat productivity over the long term for all ESUs except Snake River fall Chinook. The SRS then lists possible estimates of

potential tributary habitat improvement (range) from an “effective” habitat program. The SRS and NMFS use the Salmon River Subbasin and another finer-scale analysis (Feist *et al.*, in prep.) to illustrate how and to what magnitude this would happen. I have not reviewed the paper by Feist (*op. cit.*) but have reviewed the critical comments by Rhodes (per. comm.). Notably, NMFS and the SRS hedge their reliance on Feist *et al.* by stating, “*NMFS fully recognizes that these data are limited and projections must be approached with caution.*”

The contention that a habitat program will improve productivity and the modeling effort used to support that contention are both illusory and misleading. First, improvements in non-federal habitats will not recover the ESUs in the Snake Mountain Province when the most critical and limiting factor—migration corridor mortality—is not being addressed. The modeling fails to address this or provide any limiting factor analysis for any subbasin. In addition, the agencies and local entities have never improved or protected enough habitat to make a significant difference in smolt productivity and sustained such productivity over enough time to recover a species or stock in peril. Much less have they improved enough habitat and increased smolt production to overcome the devastating mortality of the hydropower gauntlet. There is no history of this. In general, the contended benefits of the habitat program are little more than wishful thinking.

The habitat program also suffers from lack of specifics. For instance, the plan fails to detail how they will correct enough diversions and grazing impacts to reach make the substantial projections. The modeling effort's quantitative linkages and numbers on habitat/redd production appear to be highly questionable. According to the Rhodes' review, Feist (*op. cit.*) clearly states, “*Because there is correlation between predictor variables, causal relationships cannot be inferred*” (p. 15). Rhodes further articulates that the SRS modeling effort wrongly ignored this statement by using quantitative relationships of redd abundance versus habitat improvement via changes in diversions and grazing strategies that explicitly assume causal relationships. The Rhodes' review concludes that the distorted extrapolations of the results in Feist (*op. cit.*) are scientifically untenable and deliberately misleading.

The Rhodes' review also pointed out many other discrepancies and problems with this section and analysis (based on interpretations of the Feist paper). The following is a partial listing:

- **Incorrect extrapolation beyond the scale of analysis;** most of the index reaches analyzed by Feist (*op. cit.*) were in watersheds largely under federal ownership and management. NMFS incorrectly uses these results to assert that efforts on non-federal lands will boost redd numbers within the examined reaches. Due to scale mismatch, this extrapolation is not legitimate and is highly misleading (Rhodes, pers. comm.).
- **NMFS use of the results of Feist (*op. cit.*) is untenable because the results are not applicable to current conditions.** Nothing in Feist (*op. cit.*) indicates that there is any correlated or functional relationship between habitat variables and redd density in the Salmon River after 1977 or under present conditions. Rhodes concludes that since the relationships between redd density and habitat attributes break down after 1977 due to declines in populations to homogeneously low levels, downstream mortality

swamps the relationship between habitat conditions and redd counts at the regional scale. Rhodes states “*This indicates that habitat rehabilitation, alone, even if successful (which is highly unlikely) cannot prevent salmon extirpation without major increases in survival throughout the hydrosystem.*”

- **The results of Feist (*op. cit.*) do not indicate that grazing and water diversions were the best predictors of redd density.**
- **The approach in SRS relies on the incorrect assumption that ICBEMP will adequately protect existing high quality habitats and restore priority habitats on federal lands.** ICBEMP does not include critical elements essential to meet this objective—*e.g.*, providing full protection for all roadless areas. ICBEMP is full of loopholes and discretionary guidance.
- **NMFS has no basis for assuming that federal land management actions subject to consultation have protected salmon habitat.** NMFS has not undertaken any studies or conducted any analyses to determine if activities subject to consultation have protected habitats or allowed recovery of damaged critical habitats on federal lands. To the contrary, available information indicates that conditions on federal land continue to trigger significant salmon and steelhead habitat degradation (McClellan *et al.*, 1997; Rhodes and Huntington, 2000; and Espinosa, 1998).
- **The SRS strategy on non-federal lands emphasizes process rather than specific actions.** All of the “action” elements do not prescribe action, but instead, processes that *might* lead to action sometime in the future.
- **Even if implemented, the program measures may have extremely limited benefits for habitat conditions and salmon survival.** Habitat conditions are shaped by the cumulative effects of land use and natural watershed attributes operating at the watershed scale. It is dubious that the fragmented approach and limited efforts to restore habitats will more than offset continued cumulative degradation from existing conditions.
- **NMFS has failed to ensure that actions on private lands do not exacerbate and intensify habitat degradation and additional reduction in salmon survival.** The most current “4D” rules allow considerable on-going degradation of salmon habitat by forestry and urbanization (Western Division of the American Fisheries Society and the Northwest Chapter of the Society for Ecological Restoration, 2000).

This section of the SRS ends with a discourse on performance standards and measures. What is offered is more expensive planning and modeling. I have already pointed out the major flaws in their proposals of performance measures and standards. They lack specific elements of accountability. Thus, this section likewise presents merely optimistic and unmeasurable strategies that promise to only paralyze any effective management.

### **3.0 Summary of Critique and Conclusions**

- The habitat program articulated by the SRS will not appreciably help subbasins in the Snake Mountain Province. The program will not recover threatened and endangered ESUs in the province. The program does not address primary

recovery issues in the province—*i.e.*, mortality associated with the hydropower system. The program also relegates federal watersheds in the province to secondary status for priority consideration.

- The SRS emphasizes process actions—not specific action elements that lead to improvements now.
- The program emphasizes more planning, study, monitoring, and modeling. This is a continuation of classic displacement behavior and the “paralysis by analysis” approach.
- No “hard” accountability mechanisms are defined, specified, or adopted. The substance of the program is grounded in *recycled* strategies that have a long history of failure—failure to implement, to improve, to adapt, to be accountable, and to recover.
- The program is hypocritical. On one hand, it describes the estuary as important and critical to salmonid survival. With the other hand, it fails to mention that the agencies and local entities are planning to further degrade the estuary by implementing the Columbia River Dredging Project.
- **The SRS habitat program creates an illusion that significant recovery efforts will be implemented. In reality, the SRS re-serves the *status quo* couched in *eco-rhetoric* and *ostensible promises*.**

### **Literature Cited**

**Biological Opinion.** 1998. Road Reconstruction and Emergency Watershed Protection Projects on Forest Development Road (FDR) 340 and 337, Replacement of Midvale Telephone Lines and Road Use Agreements in the Lower South Fork Salmon River. NMFS. 36p.

**Bugosh, N.** 1999. Lochsa River Subbasin Assessment (Draft). Idaho Dept. of Environmental Quality. Lewiston, ID.

**Challis National Forest.** 1988. Forest Plan. USDA Forest Service, Intermountain Region, Ogden, UT.

**Columbia Basin Bulletin.** 2000. *Delegation Wants Time Limit on Dredging Re-Evaluation*. Internet Download, CBB, 9/8, Part 1 of 1. 2p.

**Clearwater National Forest.** 1992. Forest Plan Review, Phase I Report, USDA Forest Service. Northern Region, Missoula, MT. 17p.

**Clearwater National Forest.** 1993. Letter to the Public dated October 8, 1993 detailing the Settlement Agreement with the Sierra Club and the Wilderness Society, Signed by James L. Caswell, Forest Supervisor, Clearwater N. F., Orofino, ID. 3p.

**Clearwater National Forest.** 1987. Forest Plan. USDA Forest Service, Northern Region, Missoula, MT.

**Clearwater National Forest.** 1999. Section 7 Watershed Biological Assessment, Lochsa River Drainage, Clearwater River Subbasin. USDA, Forest Service, Northern Region, Missoula, MT. 238p.

**Clifton, C. F., R. M. Harris and J. K. Fitzgerald.** 1999. Flood effects and watershed response in the northern Blue Mountains, Oregon and Washington. 1999 AWRA Annual Summer Specialty Conf. Proc., Bozeman, MT. June 30 – July 2, 1999.

**Cundy, T.W. and D. L. Murphy.** 1997. Draft Report on Landslides and Stream Changes Due To Flooding on Potlatch Corporation Lands in 1995 and 1996. 14p.

- Erickson, L. B.** 2000. Court Decision, Case No. CV-97-208-M-LBE. Wilderness Society et al. vs. Dale Bosworth and James Caswell, USDA Forest Service. 77p.
- Espinosa, F. Al, Jr.** 1992. DFC Fisheries Model and Analysis Procedures: A Training Module. Clearwater National Forest, USDA Forest Service, Orofino, ID. 80p.
- Espinosa, F. Al, Jr., J. Rhodes, and D. McCullough.** 1997. The Failure of Existing Plans to Protect Salmon Habitat in the Clearwater National Forest in Idaho. *Journal of Environmental Management* 49, 205-230p.
- Espinosa, F. Al, Jr.** 1998. Upper Lochsa River Watershed Study: Squaw and Papoose Creeks, Powell Ranger District, Clearwater NF. A flood impact study conducted for the Ecology Center and the Clearwater Biodiversity Project. 29p.
- Espinosa, F. Al, Jr.** 2000. Review and Critique of ICBEMP. Special report to Columbia River Inter-Tribal Fish Commission. 34p.
- Espinosa, F. Al, Jr.** 1998. Biological Assessment of Hazard Creek to Pinehurst Road Project. Submitted to Idaho Transportation Department. 50p.
- Feist, B. and 3 co-authors.** (2000, in preparation). A coarse-scale, spatially explicit model for predicting Pacific salmon abundance as a function of land cover and land use in the Salmon River, Idaho. NMFS, Seattle, WA.
- Fitzgerald, J. and C. Clifton.** 1997. Flooding, Land Use, and Watershed Response in the Blue Mountains of Northeastern Oregon and Southeastern Washington. Summary of poster presentation, Inland Northwest Water Resources Conference, April 28-29, 1997. 8p.
- Henjum, M. G., and 7 co-authors.** 1994. Interim Protection for Late Successional Forests, Fisheries, and Watersheds: National Forests East of the Cascade Crest, Oregon and Washington. Bethesda, MD: The Wildlife Society. 235p.
- Huntington, C. W.** 1996. Habitat Conditions and Salmonid Abundance at Monitoring Stations on Six Streams in the Lochsa River Drainage, Powell Ranger District, Summer 1996. Special Report to Clearwater National Forest. Clearwater BioStudies, Canby, Oregon. 47p.
- Huntington, C. W.** 1998. Stream Conditions and Salmonid Abundance at Four Monitoring Stations on the Salmon River Ranger District, Nez Perce National Forest. 1988-1995. Special Report to Nez Perce National Forest. Clearwater BioStudies, Canby, Oregon.
- Huntington, C. W.** 1998. Fish habitat and salmonid abundance within roaded and unroaded landscapes in the Clearwater River Sub-basin, Idaho. Pages 413-428 in M.K. Brewin and D.M.A Monita, Tech. Coords. Forest-fish conference: land management practices affecting aquatic ecosystems. Proc. Forest-Fish Conf., May 1-4, 1996, Calgary, Alberta.
- Huntington, C. W.** 1999. Plan for Monitoring Sediment, Temperature, and Channel Conditions along the Mainstem South Fork Clearwater River, Idaho. Special Report to Nez Perce National Forest. Clearwater BioStudies, Canby, Oregon.
- ICBEMP.** 2000. Interior Columbia Basin Supplemental Draft Environmental Impact Statement. 2000. Interior Columbia Basin Ecosystem Management Project. USDA and USDI. Vol. 1.
- Johnson, C.** 2000. Biological Assessment of Ongoing and Proposed Activities for Effects to Listed Sockeye Salmon, Fall Chinook Salmon, Spring/Summer Chinook Salmon, Steelhead Trout, Bull Trout, and BLM Sensitive Species. Little Salmon River, Tributaries, and Face Drainages (River Mile 86.7). BLM, Cottonwood Field Office. 55p.
- Marmorek, D., C. Peters, and I. Parnell, eds., and 32 Contributors.** 1998. PATH. Final Report for fiscal year 1998. ESSA Technologies Ltd., Vancouver, British Columbia, Canada.
- McClelland, D. G. and 8 other Co-Authors.** 1997. Assessment of the Effects of the 1995 and 1996 Flood on the Clearwater National Forest. Draft report to the Regional Forester, Northern Region, USDA Forest Service. September 25, 1997.

**McIntosh, B. A. and 6 co-authors.** 1994. Management of Eastside Ecosystems: Changes in Fish Habitat over 50 years, 1935 to 1992. General Tech. Report PNW-GTR-321, Portland, OR: USDA Forest Service, PNW Res. Sta. 55p.

**Nelson, R. and 4 other Co-Authors.** 1997. Deposition of Fine Sediment in Selected Streams on the Payette and Boise National Forests, Idaho. Report of Sediment Trends and Monitoring Efforts, 1977-1996. USDA, Forest Service. Payette and Boise National Forests. 200p.

**Nelson, R. and 4 other Co-Authors.** 1996. Deposition of Fine Sediment in Selected Streams on the Payette National Forest, Idaho. Report of Sediment Trends and Monitoring Efforts, 1983-1995. USDA, Forest Service. Payette and Boise National Forests. 146p.

**Nemeth, D. J. and R. B. Kiefer.** 1999. Snake River Spring and Summer Chinook Salmon—The Choice for Recovery. Fisheries. Vol. 24, No. 10. 16-23.

**Nez Perce National Forest.** 1987. Forest Plan. USDA, Forest Service, Northern Region, Missoula, MT.

**PACFISH.** 1996. PACFISH field review, executive summary, August-November, 1995. Prepared by PACFISH Review Teams. 13 p. Multi-Agency Review Team: Bureau of Land Management, Fish and Wildlife Service, Forest Service, and National Marine Fisheries Service.

**Pipp, M. J. and three other Co-Authors.** 1997. Watershed Response to an Extreme Precipitation and High Stream Flow Event in Managed Basins. Draft report to the Powell Ranger District, Clearwater NF, USDA, Forest Service. 101p.

**Pollution Paralysis II, Code Red for Watersheds.** 2000. National Wildlife Federation Report (Apr. 2000). 95p.

**Rhodes, J. J., D. A. McCullough, and F. A. Espinosa, , Jr.** 1994. A Coarse Screening Process for Evaluation of the Effects of Land Management Activities on Salmon Spawning and Rearing Habitat in ESA Consultations. Columbia River Inter-Tribal Fish Commission Technical Report 94-4. Portland, OR. 127p.

**Rhodes, J. J.** 1995. A Comparison and Evaluation of Existing Land Management Plans Affecting Spawning and Rearing Habitat of Snake River Basin Salmon Species Listed Under the Endangered Species Act. Columbia River Inter-Tribal Fish Comm. 108p.

**Rhodes, J. J. 1999 and 2000.** Personal Communication. Hydrologist with the Columbia River Inter-Tribal Fish Commission, Portland, OR.

**Rhodes, J. J. and C. W. Huntington.** 1999. Watershed Evaluation and Habitat Response to Recent Storms. Annual Report to BPA. Columbia River Inter-Tribal Fish Comm. and Clearwater BioStudies, Portland, OR. 21p.

**Rhodes, J. J., and 3 co-authors.** 2000. Watershed Evaluations and Habitat Response to Recent Storms. Draft Final Report to be submitted to BPA. Columbia River Inter-Tribal Fish Comm.

**Salmon National Forest.** 1987. Forest Plan. USDA Forest Service, Intermountain Region, Ogden, UT.

**Salmon/Challis National Forest.** 1999. Annual Monitoring Report. USDA Forest Service, Intermountain Region, Ogden, UT.

**South Fork, Clearwater River Biological Assessment.** 1999. Nez Perce National Forest. 221p.

**Stowell, R. and five other co-authors.** 1983. Guide for Predicting Salmonid Response to Sediment Yields in Idaho Batholith Watersheds. USDA Forest Service, Northern and Intermountain Regions, Missoula, MT and Ogden, UT. 95p.

**Umpqua Decision.** 1999. U. S. District Court, Seattle, Wash. Judge Barbara Rothstein. 25p.

*F. Al Espinosa, Critique*

ATTACHMENT 6 to CRITFC Comments

Page 30 of 32

**U.S. Forest Service, Inland Native Fish Strategy, Environmental Assessment**, (1995), US Forest Service/Bureau of Land Management, INFISH Biological Assessment, June 19, 1998.

**Viola, F.** 1997. Changed conditions in the Tucannon River Subbasin. Washington Dept. of Fish and Game. 8p.

**Weaver, W. and D. K. Hagans.** 1996. Aerial Reconnaissance Evaluation of 1996 Storm Effects on Upland Mountainous Watersheds of Oregon and Southern Washington: Report prepared for The Pacific Rivers Council, Eugene, OR. 22p.

**Weaver, W. , T. C. Brundage, and D. K. Hagans.** 1998. Aerial Reconnaissance Evaluation of Recent Storm Effects on Upland Mountainous Watersheds of Idaho. Report prepared for The Pacific Rivers Council, Eugene, OR. 42p.

**Weber, Jim.** 2000. Personal Communication. Policy Analyst. Columbia River Inter-Tribal Fish Commission.

**Woodruff, Leigh.** 2000. Water Quality Specialist. Personal Communication. Environmental Protection Agency.

## **Appendices**

- 4.1 Clearwater NF Landslides by Causal Factors**
- 4.2 Clearwater NF Landslides—Exacerbation Factor**
- 4.3 Residual Pool Depths in Crooked Fork Creek, Clearwater NF.**